A82.E779
JACC March 9, 2010
Volume 55, issue 10A

IMAGING AND DIAGNOSTIC TESTING

HYPERINTENSE CORONARY PLAQUE ON NON-CONTRAST T1-WEIGHTED CARDIAC MAGNETIC RESONANCE IS ASSOCIATED WITH CAROTID ARTERY INFLAMMATION EVALUATED BY [18F]-FLUORODEOXYGLUCOSE POSITRON EMISSION TOMOGRAPHY

ACC Poster Contributions
Georgia World Congress Center, Hall B5
Monday, March 15, 2010, 9:30 a.m.-10:30 a.m.

Session Title: MRI: Vascular Imaging
Abstract Category: MRI
Presentation Number: 1148-232

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Background: It is widely accepted that inflammation has an important role in the genesis of plaque vulnerability. A common inflammatory link for plaque activation in coronary and carotid plaque has been proposed in patients with coronary artery disease and vulnerable carotid plaques. We have recently reported that hyperintense plaque (HIP) detected by non-contrast T1-weigted cardiac magnetic resonance (CMR) coronary plaque imaging represents vulnerable coronary plaques. The aim of this study was to elucidate a hypothesis that coronary HIP may be associated with carotid atherosclerotic inflammation detected by [18F]-Fluorodeoxyglucose positron emission tomography (FDG-PET).

Methods: FDG-PET imaging for cancer screening and 1.5-tesla non-contrast CMR for coronary screening were performed in 196 consecutive patients (59 ± 10 years: men, 143; women, 53). Vascular inflammation in carotid artery was quantified by measuring the standardized uptake value (SUV) of FDG and target-to-background ratio (TBR) calculated as SUV in carotid artery divided by that in jugular vein at the same slice where the SUV of carotid artery was measured, and examined their association with coronary HIP.

Results: Of all 196 patients, HIP was detected in 118 patients (60%). Unpaired-t analysis revealed that age, SUV of carotid artery, and TBR in patients with HIP were significantly higher than those in patients without HIP ($p = 0.033, 0.017, 0.001$, respectively). Furthermore, being stratified by quartiles of SUV of carotid artery and TBR, a significant correlation between both values and a prevalence of patients with HIP was present ($p = 0.019, 0.002$, respectively).

Conclusion: The patients with coronary HIP detected by CMR have significantly higher carotid FDG uptake. This result first indicates that coronary HIP may not only allow characterizing the features of plaques, but also be associated with a severity of carotid artery inflammation.